

Ph.D. ENTRANCE TEST - 2019



GENERAL INSTRUCTIONS For Admission to Ph.D. in different subject of Agriculture Horticulture



Conducted by

AGRICULTURE UNIVERSITY, KOTA
Baran Road, Borkhera, Kota (Raj.) - 324001

1. ONLINE SUBMISSION OF APPLICATION FORM

- Only online application form will be accepted.
- The online application form can be filled as per the schedule.
- There will be separate question paper for each subject and candidate has to select the subject of his/her eligibility. M.Sc. in respective subject is essential.
- Recent passport size photograph clearly showing date of photograph (preferably not more than six months old) along with signature as single image (7H x 4W cm with 80 pixels per inch, 30 to 50 KB) should be in the jpg/jpeg/ png/bmp file format and documents in pdf format with 100 to 200KB size is to be uploaded.
- The candidate can edit the application form till given date except the information related to fee. **Do not disclose the password to any one as he/she may change your details and misuse it.** The organizers will not be responsible for such changes and consequences thereon.
- **Deposition of application fees:** The fee is Rs.3500/-(excluding bank charges if any) for UR/OBC/ SBC candidates and Rs.2000/- (excluding bank charges if any) for SC/ST/SAP (40 % and above disability) candidates. **Amount is to be deposited online only. This amount is not refundable/ transferable/ adjustable in any case.**

2. ELIGIBILITY CRITERIA FOR ADMISSION

A candidate must ensure that he/she is eligible for admission to various courses before filling the online application form for entrance test. If a non-eligible candidate is admitted due to any reason then the admission of such candidate will be cancelled as soon as the mistake is detected even at later stage. Various eligibility criteria for admission through entrance test are as under:

➤ EDUCATIONAL QUALIFICATION:

Only those candidates who have their respective Masters degree in 10+2+4+2 or 10+2+3+3 system and full fill the qualification as prescribed as under are eligible to apply.

The candidates who have passed the M.Sc. in respective subject from any recognized university with 6.5 OGPA or equivalent. In case degree awarded below 6.5 OGPA by any recognized university 5% relaxation will be allowed to candidate belonging to SC/ST/OBC (Non creamy layer)/SBC (Non creamy layer) category. **The candidates taking the advantage of 5% relaxation will not be considered in UR category.** Degree / Provisional degree certificate is essential at the time of filling the option form.

Candidates who have appeared at any of the aforesaid qualifying examinations and whose results have not been declared before the commencement of the entrance examination shall provisionally be allowed to appear in the examination. The result of the examinations i.e. PDC is essential at the time of filling the option form.

➤ AGE

The minimum age limit is 21 years as on 01-01-2019 i.e. candidate born after 01-01-1998 are not eligible. The date of birth as mentioned in the Secondary Examination mark sheet/ certificate will be considered as authentic.

➤ DOMICILE CRITERIA/RESIDENTIAL REQUIREMENT

The Examination is open to the candidates of Rajasthan domicile only or a candidate must fulfill the following conditions for admission:

The candidate must have studied for the last three years in the qualifying examination continuously as a regular student in recognized institution in Rajasthan i.e. passed 10th and 10+2 (in the qualifying subjects) from Rajasthan.

OR

Natural Father/Mother of the candidate has been continuously residing in Rajasthan for a period of last 10 years and the candidate has studied for at least 5 years during this period in the recognized educational institution in Rajasthan.

OR

The candidate must be a bonafide resident of Rajasthan. He/She may be presently studying in any of the states other than Rajasthan.

OR

The candidate is a son/daughter of a serving or retired employee of (a) Government of Rajasthan and Officer of All India Services the State Cadre of Rajasthan or (b) Undertaking/ Corporation/ Improvement Trust/ Municipal Bodies duly constituted by the Government of Rajasthan by an act of Law or (c) any of the Universities in Rajasthan or Board of Secondary Education, Rajasthan provided that the employee has worked in Rajasthan for three years preceding the last date of submission of the application.

OR

Candidate is a son/daughter of a permanent or retired employee of Indian Defense Service and the employee is either of Rajasthan origin irrespective of his/her place of posting or is posted in Rajasthan at the time of last date of the application for admission provided that in case the defense personnel is of Rajasthan origin, a Certificate has to be submitted by him/her from the employer to the effect that his/her State of origin is Rajasthan at the time of entry in to service.

OR

Candidate is a son/daughter of permanent (serving/retired) employee of Para-Military Forces of India and the employee is either of Rajasthan origin irrespective of his/her place of posting or is posted in Rajasthan at the time of last date of application for admission provided that in case of Para-Military Personnel from the Rajasthan origin, a certificate has to be submitted by him/her from the employer to the effect that his/her State of origin is Rajasthan at the time of entry into service.

OR

Candidate is a son/ daughter of a Judge of Rajasthan High Court subject to that he/she submit an undertaking/affidavit stating that such benefit is not claimed or availed by them in any other State.

Note:

- The relevant original documents / certificates which are the basis of eligibility of the candidate are to be furnished by the candidate at the time of registration in the college along with one self-attested set of above documents and photograph.
- The certificate of bonafide resident of Rajasthan will have to be duly signed by the District Magistrate of the concerned District or officer authorized by him, and must bear the authenticated photograph of the candidate.
- In case of serving personnel, where in-service conditions have resulted into eligibility, a certificate of the employer will have to be submitted by the candidate, with appropriate authentication, identification and verification.

3. RESERVATION OF SEATS

- The reservation of seats for various categories will be as per the rules of Government of Rajasthan and subsequently adopted by AU, Kota.

- The caste certificate must bear the photograph of candidate and must be issued by the competent authority.
- In case of OBC/SBC the certificate should not be more than one year old i.e. not earlier than **04-04-2018** and must clearly indicate non creamy layer. Such certificate along with affidavit of non creamy layer should not be earlier than 01-04-2016.
- **Reservation for wards of defense personals will be in following priority order. (In pursuance to deputy secretary Agriculture (Gr. III) letter No. प. 3(9)कृषि-3/2018 जयपुर दिनांक 03-07-2018 and Agriculture University, Kota Notification No. एफ ()/कृवि/कोटा/ प्रबन्धमण्डल /2018/11335-49 दिनांक 12-12-2018 :**

Priority-I : EXS (a)- Killed in Action

Priority-II : EXS (b) – Disabled in action and boarded out from service/died while in service with death attributable to military service/disabled in service and boarded out with disability attributable to military service.

Priority-III: EXS (c) – Gallantry Award Winners

Priority-IV: EXS (d) – Ex-Servicemen

The domicile requirement for the wards of the Defense personnel from the State of Rajasthan but serving in other State is waived off. For wards of Defense personnel from other State but serving in the State of Rajasthan, the domicile condition is waived off to enable them to be selected in general quota. However, they would not be eligible for the above mentioned concessions.

50 % of the reserved seats will be earmarked for the girls. In case of non-utilization by girls, the utilized vacancies would revert back to the boys' category.

- Candidates are requested to upload the valid relation certificate issued by competent Army authority where priority should be clearly mentioned. Please note that Army Canteen Cards or ID cards etc. will not be considered as valid document.

4. INSTRUCTIONS FOR FILLING ONLINE APPLICATION FORM

The application will be accepted online only. The process of online submission of application form will be available at the website <http://www.jetcoakota.com>. Link of this web site will also be available on AU, Kota website www.aukota.org. The examination schedule is given separately.

Candidates must perform the following activities while submitting the online application form:

Step-1: Off line preparation for filling the Online Application Form:

Candidates are advised to go through these instructions and before starting filling of application form he or she must keep all relevant documents ready to avoid any reason for non-accepting the form by the system.

- Take a recent photograph not older than six months showing the date of photograph of 5H x 4W cm size. Paste the photograph on plain paper and sign below the photograph 2H x 4W cm size. Scan it in jpg/jpeg/pjpeg/png/bmp/tif/gif format with 80 pixels per inch resolution. The image size of photo with signature should be in between 30 to 50 KB. Sample image is already given on web site.
- Fee concession certificate i.e. Caste category and/or specially abled person certificate indicating 40 % and above disability should be scan in “pdf” format having size 100 to 200KB.

- Scan mark sheets of X and XII examination and degree certificate of UG and PG in “pdf” format having size 100 to 200KB.
- Mobile number on which candidate wants to get SMS related to this examination from Coordinator office. All the information will be sent through SMS on this mobile. Use your own or close relative mobile number avoid mobile number of Coaching Centre and Emitra. Not more than three applications will be accepted on a common mobile number.
- **Incase non availability of mobile number or change in mobile number candidate will not get the information for which this office will not bear any responsibility.**

Step-2: Depositing the fees

- Candidate must read the instructions given on the web site carefully.
- Fees of Application form is Rs. 3500/- + bank charges if any for General/OBC/SBC candidates and Rs.2000/- + bank charges if any for candidates of SC/ST/SAP (40% and above disability). Fees will be acceptable online only after filling the essential information.
- This fee is not refundable/ transferable/ adjustable in any case.
- Deposit the fees from your own or close relative account/ credit/ debit card avoid the account or credit/ debit card of Emitra or any other agency to avoid difficulty in case of refund if any.
- Candidates are advised to keep the details of bank account viz., Name of the bank and branch, account holders’ name, number, type of the account etc. for ready reference in near future.

Step-3: Filling of Online Application Form

- The entries of online application form must be filled as required.
- Candidate should ensure that the photo and signature belongs to the same person i.e. his/her only.
- The changes (if required) will be allowed in online application form up to a given date using registration number and password. **Keep the password very safe as anyone can change your details and misuse it due to this for any change in your application form this office will not be responsible. Do not share the password details.**

Step-4: Printing of application form

- Click the Print button on the web portal and get print of application form. Keep this print for your record.
- **Candidates need not to send hard copy of application to the Coordinator.**

5. ADMIT CARD

Admit card will be available on web site www.jetcoakota.com as per schedule till commencement of exam. **No admit card will be sent by post or personally to the candidates.** The Coordinator reserves the right to withdraw the permission granted by error to a candidate who is not eligible to appear in the examination even though the admission card has been issued and produced by the candidate before the centre superintendent.

6. EXAMINATION SCHEME

- In the very nature of competitive examination, no syllabus can be prescribed. However, it is an exercise to pick up the best. There would be a separate question paper for each subject and candidate must ensure the same.

- The Question Paper would be covering the entire subject studied in undergraduate and post graduate degree programme. Broad outline of subject content is given in the syllabus.
- The question paper will be only in English and consists of 100 multiple choice type questions. There would be four suggested options [(1), (2), (3), (4)] to each question.
- The candidates are required to choose the most appropriate option and blacken the corresponding circle with the black ball point pen in the OMR sheet (Details for filling answer sheet are given on back side of OMR sheet). The test booklet may be used by the candidates for rough work and the squares printed in it may be used for deciding the correct answer. Assessment will be made only on the basis of marking on the OMR sheet. At the end of examination candidates may carry question booklets with them.
- **Marking scheme:** Four marks will be awarded for every correct answer and one mark will be deducted for every wrong answer (**Negative marking**). If more than one option is chosen, it will be treated as wrong answer. No marks will be awarded or deducted for unmarked/unattempted questions.
- The merit list will be prepared on the basis of obtained marks only.
- After obtaining the objections, if any question found ambiguous or having ambiguous answer, correct answer more than one, no correct answer will be dropped and merit will be prepared on the basis of obtained marks of remaining questions.

7. WRITTEN EXAMINATION SCHEDULE:

Written examination will be conducted as per schedule from 11.00 AM to 1:00 PM.

The schedule of the test will be:

| | | |
|--|---|----------|
| Candidate should report to the examination centre | : | 10:00 AM |
| No candidate will be permitted after | : | 10:45 AM |
| Commencement of the examination | : | 11:00 AM |
| Candidate will not be allowed to leave the examination hall before | : | 01:00 PM |

NOTE: Information regarding college wise number of seats, filling of option form etc. for seeking admission will be displayed after declaration of result.

SYLLABUS:

Objective of such entrance test is to select the best therefore no syllabus can be prescribed however a broad outline is given as follows:

01- AGRICULTURAL CHEMISTRY and SOIL SCIENCE

Rocks and minerals; mineral weathering and soil formation; classification of soils, major soils of India; principal silicate structures; nature and properties of organic and inorganic constituents of soils, ion exchange phenomenon; activity of ions in soil system; fixation and release of nutrients. Soil fertility evaluation; movement of water; problematic soils, soil-related constraints in crop production and remedial measures, soil amendments; soil and water conservation; sampling and analytical procedures for soils, plants, water, manures, fertilizers and soil amendments; quality of irrigation water; fertilizer recommendations; soil organic matter, soil micro flora; carbon, nitrogen and phosphorus cycles; biofertilizers; phosphate solubilization; Darcy's law; Fick's law, steady and transient state diffusion in soils. Essential plant nutrients; manures; utilization of organic wastes and industrial by-products; fertilizers and their production, properties and usage; secondary and micronutrients.

02- AGRICULTURAL ECONOMICS

Basic concepts in economics, theory of consumer demand, theory of production, market classification, theory of perfect and imperfect competition, theory of distribution, national income

accounting, classical and Keynesian theories of income determination, money-concepts, functions, theories of demand for money, supply of money; general equilibrium of product and money markets; IS and LM functions; monetary and fiscal policies, banking - central and commercial, functions and problems of recent macroeconomic, policies of Government of India; research methodology, steps in agricultural economics research, data collection, analysis and report writing; simultaneous linear equations, linear programming, statistical inference, correlation and regression analysis, time series analysis and theory of index numbers. Nature and scope of agricultural production economics vis-a-vis farm management; farm business analysis, farm records and farm cost accounting; farm planning and budgeting, production function and resource allocation; assumptions of production function and different form of production functions, cost, profit and supply functions; nature and analysis of risk in farming; systems approach in farming; role of credit in agriculture, principles of agricultural finance, farm financial management, supply and demand for farm credit; recent innovations in the extension of credit to agriculture, theory and practice of cooperation; problems of cooperatives, management of co-operative institutions; cost-benefit analysis of agricultural projects. Scope of marketing in a developing economy; practice and problems of marketing agricultural inputs and outputs; functions and channels of marketing, co-operative marketing; agricultural price analysis; demand analysis; problems and prospects of storage and processing of agricultural products; agricultural exports -problems and prospects. Market intermediaries and their role, marketable & marketed surplus estimation, marketing efficiency, market integration, APMC regulated markets - Direct marketing, contract farming and retailing - Supply chain management, role of information technology, telecommunication in marketing of agricultural commodities. Theory of growth and growth models; agricultural policy, planning and development in India, interregional variations in agricultural development, agricultural technology and income distribution; agrarian reforms and output and input price policies; infrastructure and institutions for agricultural development, equity and ecological consideration in agricultural development. OLS and their properties, multi-collinearity, heteroscedasticity and autocorrelation. Concepts, classification and problems of natural resource economics- Economy Environment interaction, Resource scarcity - Limits to Growth - Measuring and mitigation natural resource scarcity, common property rights, sustainability, environmental pollution.

03- AGRONOMY

Principles of crop production, crop plants in relation to environment, concepts involved in growth analysis; quantitative agro-biological principles and their validity; classification of climate, agro-climatic zones of India and Rajasthan, their characteristic features; physiological limits of crop yield and variability in relation to the agro-ecological optimum; types of tillage - concepts and practices; recourse conservation technology. Weed ecology & physiology; crop-weed interference; methods of weed control; principles and practices of weed management in crops and cropping systems; herbicide-formulations, classification, selectivity and mode of action; adjuvants; integrated weed management; herbicide resistance. Agro-meteorology in relation to crop environment; solar radiation utilization & photosynthesis; monsoon characterization; weather forecasting; climate change: its impact on agriculture, mitigation and adaptation. Introduction, origin, history, production, distribution, cultural practices, varieties, quality, biomass production and bioenergetics of major field crops, forage, vegetable, spices and condiment crops. Soil fertility and its management; essential plant nutrients, their functions and deficiency symptoms in plants; dynamics of major plant nutrients; organic manures, chemical and biofertilizers and fertilizer uses; integrated plant nutrient management; precision farming & site-specific nutrient management;

organic farming: concept, principles & components, quality parameters, labeling & accreditation process. History of irrigated agriculture, soil-water-plant relationship, soil moisture stress and plant growth; drought resistance in crops, mechanisms of drought tolerance, and crop adaptability, soil and plant moisture conservation techniques, water harvesting and other agro techniques for dryland agriculture; measurement of soil moisture, methods of scheduling irrigation, methods of irrigation for crop plants, quality of irrigation water; watershed management concepts; management of excess soil water, agricultural drainage, principles and practices; problem soils - saline, alkali, saline-alkali and acid soils, soil erosion and its control. Cropping systems - principles and practices; changing cropping patterns in different agro-climatic zones; Sustainability - concept and practices; agro-forestry systems - concepts and practices. Principles of experimental designs, analysis and interpretation of data, methods of statistical analysis and statistical designs.

04- ENTOMOLOGY

Position of insects in animal kingdom - their origin, phylogeny and distribution; history and basis of insect classification; distinguishing characters of insect Orders and economically important families; concept of species and speciation; rules and regulations of zoological nomenclature; morphology - external and internal; embryonic and post-embryonic development. Insect ecology - biotic potential, biotic and abiotic resistance, effect of temperature, humidity and light on insect development and population dynamics; diapause, food chain, migration and dispersal. Life table concept, survivorship curves, degree-day model, predator prey relationship, diversity indices (index). Fundamentals of insect physiology, different systems, their structure and function, metabolism, sense organs, insect behavior, host plant relationship. Social and other beneficial insects; pests of field crops and stored food; principles of pest control; classification, mode of action and metabolism of insecticides; insecticidal residues; resistance and resurgence; parasites, predators and pathogenic microorganisms of crop pests, biological control. Antifeedants, hormones, growth regulators, semi-chemicals, host-plant resistance and genetic manipulation, insect quarantine; concept of integrated pest management; non-insect pests and their control.

05- EXTENSION EDUCATION

Objectives, philosophy and principles of extension education; extension role of agricultural universities; comparative studies of extension education system in selected developed and developing countries; different models of organizing agricultural extension, particularly tools and methodology; agricultural information (knowledge) system; teaching and learning processes; principles of adult learning; audio visual aids and their classification; modern communication and information technology; application of PERT/CPM, principles of programme planning process; agricultural and rural development programmes in India, namely CD, Panchayatiraj System, IADP, IRDP, SGSY, PMGSY, DPAP, KVK, ATIC, ATMA, IVLP, ICDS, NREGP, Farmers Field School, Kisan Call Centre. Principles of extension management, different theories of management processes and functions of managerial organizational set-up for extension services in India including the T & V system; types of training programmes for extension personnel and farmers; model of modern training, modern technologies, experimental learning methods, entrepreneurial development process; factors affecting extension training. Participatory extension approaches (RRA, PRA, PLA, AEA, PAR, FPR); Participatory tools and techniques; Participatory technology development and dissemination. Scope and importance of psychology in extension education, concept of human society; characteristics of rural people; socio-psychological basis of human behavior, socio-psychological factors in transfer of technology; social structure; social interactions and processes; values and norms of rural social systems; rural institutions; role of leadership;

process of diffusion and adoption; consequences of adoption of innovations; communication process and elements of communication; theories of communication, fundamentals of farm journalism; role of mass media; modern electronic media. Process of scientific research; research designs; data collection devices; validity and reliability of measuring devices; methods of observation and data collection; techniques of tabulation; analysis of data and report writing; methods of statistical analysis; statistical designs.

06- HORTICULTURE

Importance scope, area and production of major horticultural crops. Recent trends in planting systems, cropping systems, improved varieties, canopy management, nutrient management, water management, fertigation, role of bioregulators, biotic and abiotic factors limiting fruit production, physiology of flowering, pollination fruit set and development, physiological disorders, insect pest and diseases, maturity indices, harvesting, grading, packing, storage and ripening techniques of fruit crops –mango, banana, citrus, guava, grapes, pomegranate, papaya, sapota, custard apple, aonla, phalsa, ber, apple, pear, peach, plum, strawberry, wood apple, bael, litchi. Propagation, tissue culture and nursery management of fruit plants. Biodiversity, germplasm conservation, gene centers, intellectual property rights of fruits crops. Introduction, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, sowing/planting times and methods, seed rate and seed treatment, nutritional and irrigation requirements, intercultural operations, weed control, mulching, physiological disorders, harvesting, post-harvest management, plant protection measures of vegetables- tomato, brinjal, chilli, okra, cucurbitaceous vegetables, beans, sweet potato, yam, cole crops, root crops, peas, leafy vegetables, bulb crops. Introduction, importance of spice crops-historical accent, present status - national and international, future prospects, botany and taxonomy, climatic and soil requirements, commercial varieties/hybrids, site selection, sowing/planting times and methods, nutritional and irrigation requirements, pharmaceutical significance, plant protection measures, physiological disorders - black pepper, cardamom, clove, cinnamon and nutmeg, turmeric, ginger and garlic, coriander, fenugreek, cumin, fennel, ajwain, Scope and global scenario of cut flowers in global trade, varietal wealth and diversity, Patent rights, nursery management, influence of environmental parameters, light, temperature, moisture, humidity and CO₂ on growth and flowering. Cut flower standards and grades, harvest indices, Water and nutrient management, fertigation, weed management, rationing, training and pruning, disbudding, special horticultural practices, use of growth regulators, physiological disorders and remedies, IPM and IDM in crop- rose, chrysanthemum, carnation, gerbera, gladioli, tuberose, orchids, anthurium, aster, lilies, dahlia, gypsophilla. Landscape designs, types of gardens, Styles of garden, Urban landscaping, Landscaping for specific situations, Garden plant components, Lawns, Establishment and maintenance, Bio-aesthetic planning, eco-tourism, theme parks, indoor gardening, therapeutic gardening, non-plant components, water scaping. Cacti, succulents, tree, shrubs, climbers, alpine and annual flower plants in landscaping. Important landscape in India. Maturity indices, harvesting practices for specific market requirements, Physiology and biochemistry of fruit ripening, pre-cooling, Methods of storage ventilated, refrigerated, MAS, CA storage, physical injuries and disorders. Packing methods and transport, principles and methods of preservation, food processing, canning, fruit juices, beverages, pickles, jam, jellies, candies. Dried and dehydrated products, Role of photoperiod, vernalization, dormancy, respiration, transpiration, photosynthesis and senescence in plants. Essential plant nutrients and their uptake in horticultural crops.

07- LIVESTOCK PRODUCTION AND MANAGEMENT

Advances in housing management of dairy cattle and buffaloes in various agroclimatic zone of India. Management systems for cattle and buffaloes. Establishing Dairy Cattle Enterprise. Breeding Management. Advances in Feeding Management of cattle and buffalo, feeding for milking herd, dry cows, bulls and calves, Management of high yielding animals. Numbers and distribution of milch and dual-purpose breeds of cattle and buffaloes. Sheep production. Advances in feeding management, Nutrient deficiencies in forage, General feeding practices, Feeding materials, Feeding lambs and ewes during lactation. Role of sheep husbandry in agriculture, Present development programmes in sheep and goat production. Role of goat in animal agriculture, Goat farming in India, selection of Breeding stock, Breeding problems, Housing, Principles of feeding, Milking practices. The present and future of Swine production systems in India and production policies adopted in advanced countries. Principal of animal experimentation. Planning and designing of experiments. Integration of research in various disciplines of animal production. Scientific writing research papers, reviews and reports etc. and their presentation. Importance and limitations of rabbits for meat and fur production. Common breeds and strains of poultry. Utilization and disposal of animal waste, Health hazards, Waste utilization, technologies for processing and treatment of animal wastes.

08- MOLECULAR BIOLOGY AND BIOTECHNOLOGY

Structure and organization of prokaryotic and eukaryotic cells; Cytoskeletal elements; organization and expression of prokaryotic and eukaryotic genome; concept of gene; quantitative trait loci, mutation; genetic recombination; transformation; transduction; conjugation; structure, function and regulation of genes in prokaryotes and eukaryotes; transcription and translation; recombinant DNA, restriction enzymes, vectors, plasmids, cosmids and bacteriophages, expression vectors, cloning strategies, construction and screening of genomic and cDNA libraries, nucleic acid hybridization and DNA sequencing; restriction fragment length polymorphism; monoclonal antibodies and their application; enzyme engineering; genetic transformation of eukaryotes; crop improvement through genetic engineering; role of tissue culture in crop improvement; microbes in agriculture and industry; structure and function of proteins, nucleic acids, carbohydrates, lipids, enzymes; metabolism, glycolysis, citric acid cycle; respiration, bioenergetics; nucleic acid and protein biosynthesis; photosynthesis, nitrogen fixation. PR in Biotechnology. Biosafety and Bioethics issues. Cell division and regulation of Cell cycle; Membrane transport; Signal transduction; Protein targeting; Molecular marker and its application in Agriculture; Genomics, Proteomics and metabolomics; Properties of nanomaterials and characterization, Synthesis and Application of nanomaterials. Introduction to Bioinformatics and Biological database. BLAST and FASTA.

09- PLANT BREEDING and GENETICS

Structure and function of cell and cell organelles, cell cycle; mitosis and meiosis; nucleic acids – their structure; Mendelian principles; chromosome structure and organization; types of chromosomes; chromosome function; linkage and crossing over - theories and molecular mechanism; recombination and gene mapping in diploids, fungi, bacteria and human; ploidy variations - euploids and aneuploids; chromosomal aberrations; extra chromosomal inheritance; gene mutation-mechanism, induction; gene concept; complementation, genetic code, information transfer and protein synthesis, gene regulation and gene manipulation; gene transfer technology; origin and evolution of important crop plants like wheat, rice, maize, sugarcane, potato, brassica, cotton, etc. Genetic basis of plant breeding; pureline selection; male sterility and incompatibility and their use in plant breeding; pedigree selection, mass selection and backcross method of selection; heterosis; plant introduction and exploration and their role in plant breeding; breeding

for disease, insect and pest resistance; role of interspecific and intergenetic hybridization; population improvement procedures; recurrent selection techniques; combining ability and its relationship with the components of gene action; seed production techniques; selection methods and changes in gene frequencies; mutation and its role in breeding; use of biotechnology in plant breeding. Molecular markers and their applications in genetic analysis and plant breeding.

10- PLANT PATHOLOGY

Landmarks and pioneers of plant pathology; theory of microscopy and staining; structural and physiological differences amongst fungi and fungi like organism, bacteria, rickettsia's, phytoplasma and spiroplasma, viruses and viroids; principles of culturing and preservation of pathogens; characteristic symptoms; host-parasite relationships and its basis; symbiosis; economically important diseases of crop plants induced by fungi and fungi like organism, bacteria, rickettsia's, phytoplasma and spiroplasma, viruses and viroids; phanerogamic parasites, non-parasitic diseases; nutrition, growth, reproduction, lifecycle, ultra structure, genetics and classification of microorganisms; Molecular methods for detection and diagnosis of Pathogenic microbes like fungi, bacteria and viruses. Mendelian principles; cell structure; seed germination; origin of life and evolution; beneficial microorganisms including mycorrhiza; variation in phytopathogens and their ecology; introductory epidemiology.

FACULTY OF HORTICULTURE

01- FRUIT SCIENCE

Importance scope, area and production of fruits, classification of fruit crops, climatic and soil requirement, Principles of pruning and training, weed control; modern methods of propagation including root stock and micro propagation; Use of growth regulators in fruit crops; water management; use of biofertilizers; High density orcharding. Improvement of plant types of important fruit crops; physiological manipulations for overcoming problems like biennial bearing, spongy tissue, malformation, necrosis and black tip in mango; delayed maturity and uneven ripening in grapes and granulation in citrus. Important statistical designs; methods of their statistical analysis; General principles of flower and vegetable production; major methods of preservation and processing of horticultural crops. Cultivation practices of major fruit crops like mango, citrus, banana, grape, papaya, guava, pineapple, loquat, phalsa, jackfruit, mangosteen, sapota, cashew nut, ber, pomegranate, date palm, aonla and temperate fruits like apple, pear, peach, almond, plum, apricot and cherry.

INSTRUCTIONS FOR WRITTEN EXAMINATION

- The examination will be held as per the programme given. The doors will be opened at 10.00 AM.
- The candidate should ensure that he/she occupies the allotted seat at allotted place only. Any candidate occupying the seat of another candidate or change the place shall be treated as case of unfair means and his/her candidature will not be considered for admission.
- Candidates should bring the following documents/ items at the time of examination.
 - i. The admit card downloaded from the **www.jetcoakota.com** website.
 - ii Original recent photo ID.

Black ball point pen for marking the answers will be provided at the centre.

- Candidates should not bring any text-book or notes, log tables, calculators, cell phone, purse/bag, watch, jewelry, any electronic gadget by which communication is possible and any

other objectionable material with them in the examination hall.

- All Jewellery should be removed at the home so that no problem may arise at centre to remove the same and theft if any as centres shall not be responsible for security of belongings of candidates. With Jewellery candidate will not be allowed in examination.
- Candidates should carefully read the instructions given in the question paper booklet and OMR before they begin to mark their answers.
- The question paper will be in English only.
- Soon after the question booklet is given to the candidate, he/she should ensure that it is sealed and contains all the pages and no question is missing before writing role number.
- Entry of booklet number and series on OMR should be done only after getting proper question booklet and satisfying yourself.
- Question booklet/ OMR sheet shall be replaced to candidate only when there is any printing defect/torn condition within 10 minutes i.e. up to 11:10 AM.
- Before attempting the answers, the candidate shall write his/her Roll number and other details at the place provided for the purpose on the test booklet and OMR sheet. The candidate should indicate the answer by blackening the circle with black ball point pen provided for the purpose in the OMR sheet itself, otherwise his/her answer will not be evaluated. Candidate must ensure that their OMR has been duly signed by invigilator also.
- The candidate should not write his/her name or mark any sign/mark at any place on the answer sheet, which may disclose his/her identity else their candidature will be cancelled.
- No candidate shall leave his/her seat or the examination hall till the end of the examination without the permission of the Invigilator /Centre Superintendent.
- During the course of examination, the candidate shall be under the discipline and control of the Centre Superintendent and shall abide by the instructions issued during the examination by the invigilators or the Centre Superintendent from time to time.
- Candidate found acting in a manner, which in the opinion of the invigilator, is liable to give unfair advantage to another candidate, shall be treated case of unfair means and his/her candidature will be cancelled.
- The invigilators, Flying squad and Centre Superintendent shall be competent to take search of any candidate. A candidate possessing objectionable material or resisting search shall be punishable as per rules of unfair means and lose his/her candidature.
- Candidate resorting to use of unfair-means shall be turned out of the examination hall/room and his examination shall be treated as cancelled. The Centre Superintendent shall be the judge to determine whether unfair-means have been resorted to. He/she will submit the report stating full facts of the case of unfair-means to the Coordinator for further necessary action.
- Urinals for use of examinees shall be provided at the Centre and every examinee shall be required to use one of those urinals only. For this the candidate shall not leave the examination room without the permission of the invigilator and escort. Permissible only in case of emergency.
- Smoking and consumption of other intoxicants are strictly prohibited in the examination hall/room/centre and will be treated as unfair means.
- No guarantee is given to the candidates regarding the order of the questions in question

paper.

- The result of the test will be declared on specified date. No enquiries by email, telephone or post concerning the result will be attended by the Office of the Coordinator.
- Candidate should note that there will be no re-evaluation of the OMR sheet.
- All original documents are to be submitted to the allotted college at the time of registration.

EVALUATION OF OMR SHEETS

- The OMRs will be evaluated and marks will be displayed as per schedule.
- Four marks will be awarded for every correct answer and one mark will be deducted for every wrong answer (Negative marking). If more than one option is chosen, it will be treated as wrong answer. No marks will be awarded or deducted for unmarked/ un- attempted questions.
- **Candidate can challenge the answer key as per given schedule (objection on any question) by paying Rs. 500/- towards processing fees per question. The fees can be paid online through Debit/Credit/Net Banking etc. Candidate should note that the fee paid will be refunded if the challenge is found correct. However no challenge will be entertained without receipt of processing fees.**
- After getting the objections, if any question found ambiguous or having ambiguous answer, correct answer more than one, no correct answer will be dropped and merit will be prepared on the basis of obtained marks of remaining questions.
- Revised marks will be updated and allow to fill the option form as per schedule.

8. FILLING THE ONLINE OPTION FORM

- There is online option form fee of Rs 5000/-. The bank charges will be charged extra. Deposit the online fee from your own or relatives bank account/ debit or credit card. Avoid Emitra account or close the account so you may not face any problem in refund if any.
- Candidate must read the instructions very carefully before filling up the option form to avoid any mistake.
- Candidate must keep ready the information and list of colleges along with order of choice on a separate paper and mark sheets or desired certificates if any.
- **There will be no provision for any change/modification after final submission of the option form however candidate may edit the option up to stipulated date.**
- Only candidates obtaining 33% or higher marks will be eligible for filling the option form. A relaxation of 5% will be applicable fore cast categories i.e. SC/ST/OBC (NCL)/SBC (NCL).
- Candidate willing to seek admission **on payment seat** should also fill the option for the same with appropriate number of choice. These seats will also be filled from the same merit.
- Details about college, fees and hostel facility may be obtained from “About the colleges” of this web site or he/ she may contact to the college directly.
- Fees of Rs. 5000/- deposited with option form (online) will be adjusted in college fees of the candidate. **In case of not reporting in time this amount will be forfeited** i.e. neither it will refunded to the candidate nor transferred to the institute where candidate admitted provisionally.
- **Candidate is advised to check the correctness of information before submitting the**

option form. In case of any wrong information the admission will be cancelled at college level and candidate will be treated as not reported and this seat will be allotted to another candidate in next counseling and option form fee will be forfeited.

- If candidate will not get admission in any of the institute filled in option form the fee will be refunded through the same channel where from he/she paid the fees.
- **In case amount is deposited from Emitra or any other agency account take all bank details wherefrom this amount has been deducted. As amount will be refunded in this account and he may not refuse to pay the refund.**

Seat Allotment

- On the basis of obtained marks and reservation policy the institution will be allotted on the basis of option form.
- In case of any tie, the tie will be break on the basis of higher marks obtained in PG than in UG than in 12th than in 10th than more in age will be given priority.
- Through above option form three times seats will be allotted.
- The reserve seats will be allotted to reserve candidates only, if option form of those category candidates is available else the seat will filled from the candidates wherefrom that seat get reserve.

Upward Assessment

First upward assessment:

- The candidates get institution in first allotment either deposit the fees of that institution online or apply for upward assessment in case he/she wants to change the institution have to pay online fee of Rs 800/- for upward assessment else candidate will be treated as not reported.
- The seats of not reported candidates and candidates applied for upward assessment and gets other institution will be filled by the remaining candidates and candidates applied for upward assessment on the basis of merit and taking reservation under consideration.

Second upward assessment:

- Candidates get seat in second allotment (upward or new) have to either deposit the fees of that institution online or apply for upward assessment in case he/she wants to change the institution have to pay online fee of Rs 800/- else candidate will be treated as not reported.
- The seats of not reported candidates and candidates applied for upward assessment and gets other institution will be filled by the remaining candidates and candidates applied for upward assessment on the basis of merit and taking reservation under consideration.
- On or before stipulated date the candidates get seat in third allotment has to deposit the fees of that institution online else candidate will be treated as not reported.
- The upward assessment fee Rs.800/ is non refundable whether candidate get better choice from the option form or not.
- After upward assessment if he/she get any other college or allotment remain unchanged he or she will be required to accept final allotment and deposit the requisite fee of allotted college otherwise the admission will be treated as cancelled and amount Rs.5000/ deposited will be forfeited.

9. REPORTING IN THE INSTITUTION

- Candidate accepted the allotment and deposited the online fee has to report in the institution on the schedule date along with all original documents and their self-attested copies viz. UG and PG PDC, 10th and 12th mark sheets and certificates, domicile certificate, reservation certificate, self-declaration (in case of OBC and SBC) certificate, recent income certificate and fee deposition receipt.
- Failing to report on the given date or lacking any document will be treated as not reported candidate and the option form fee will be forfeited. Vacant seat will be filled by other candidate in next counseling. Institution fee (other than option form fee) will only refund if the seat will filled.

10. ONLINE SPOT COUNSELLING

- If seats remain vacant after above reporting same will be filled through online spot counseling.
- Online option form will be invited as per the schedule.
- Candidates not get admission or not reported candidates will be eligible for online option form. Candidates reported in the institutions will not eligible.
- Online option form may be filled after paying Rs 5000/- + bank charges.
- Candidates not get seat through previous option form need not to pay the option form fee again but, have to fill the fresh option form.
- Vacant seats will be filled by the category candidates if available else from the candidates wherefrom the seat get reserve using merit and above option form.
- Candidate has to deposit the fee of allotted college online and report in the college on given date along with all original documents and their self-attested copies.

11. ON THE SPOT ONLINE COUNSELLING

- If seats remain vacant same will be filled through this counseling.
- This counseling will be held only at Kota centre.
- Vacancies will be declared later on.
- Candidate has to report in time.
- Candidates not get admission or not reported candidates will be eligible for filling the option form. Candidates reported in the institutions will not eligible.
- Online option form may be filled after paying Rs 5000/- + bank charges. Candidates not get seat through previous option form need not to pay the option form fee again.
- Vacant seats will be filled by the category candidates if available else from the candidates wherefrom the seat get reserve using merit and above option form.
- Candidate has to deposit immediately the fee of allotted college (online) and all original documents and their self-attested copies.
- Candidate has to report in the college on given date. The admission process will be closed with this process even seat remains vacant. As per the Hon,ble Governor, Govt. of Rajasthan the last date of admission is 31-07-2019.

Change if any will be notified time to time.

Ph.D. ENTRANCE TEST- 2019

ANSWER SHEET, SIDE-I

(USE PROVIDED BLACK BALL POINT PEN ONLY)

ROLL NO. (IN FIGURES)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

ROLL NO. (IN WORDS)

| | | | | | | | |
|-----|-----|-------|------|------|-----|-------|-------|
| ONE | TWO | THREE | FOUR | FIVE | SIX | SEVEN | EIGHT |
|-----|-----|-------|------|------|-----|-------|-------|

QUESTION BOOKLET NO.

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

 SERIES

| |
|---|
| A |
|---|

INSTRUCTIONS FOR FILLING SIDE II OF ANSWER SHEET (OMR)

Example for filling side II of Answer Sheet

| ROLL NO. | | | | | | | | Number | Example |
|-----------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|--------|---------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 2 | 1 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 3 | 2 |
| <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 4 | 3 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 5 | 4 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 6 | 5 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | 7 | 6 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | 8 | 7 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | 9 | 8 |
| <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 0 | 9 |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | 0 | 0 |

There are 1 to 100 questions of multiple choice darken only one circle out of four option.

Example

Q. Jaipur is the capital of ?
 1. Punjab 2. Uttar Pradesh 3. Gujarat 4. Rajasthan

Instructions for marking Answers

1. Use provided black ball point pen only for blackening (shading) the circle on side II of the Answer sheet.
2. Blacken the circle completely and uniformly so that the letter/number inside the circle is not visible.
3. Blacken only ONE circle for each answer as shown in the example below.



4. Blacken/Darken the circle with pen in the space provided. Do not make any stray mark on the Answer sheet, or touch pen on any other circle.
5. Rough work **must not be done** on the Answer sheet. Use your test booklet for doing the rough work.
6. Once you darken the circle, you cannot change the answer. Do not use any eraser or fluid.
6. For every correct answer four marks will be awarded.
7. There will be negative marking (one mark will be deducted for every wrong answer).

Name & Signature of the Candidate

Ph.D. ENTRANCE TEST - 2019

OMR ANSWER SHEET SIDE - II

| ROLL NO. | SUBJECT CODE | FACULTY | OMR SHEET NO. & BARCODE | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------|------------------------|--------------------------|--------|--------|--------|--------|---|--------|--------|--------|--------|--------|--------|--------|--------|--|---|---|----|----|---|--|---|--|
| <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">000000</td> </tr> </table> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> <td style="border: 1px solid black; width: 25px; height: 25px; text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">00</td> <td style="text-align: center;">00</td> </tr> </table> | 0 | 0 | 00 | 00 | <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; width: 100%; height: 25px;"></td> </tr> <tr> <td style="text-align: center;"> <input type="radio"/> AGRICULTURE <input type="radio"/> HORTICULTURE </td> </tr> </table> | | <input type="radio"/> AGRICULTURE <input type="radio"/> HORTICULTURE | <p style="font-size: small; text-align: center;">1 2 3 4 5 6</p> |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | |
| 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | 000000 | | | | | | | | | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | |
| 00 | 00 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="radio"/> AGRICULTURE <input type="radio"/> HORTICULTURE | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SIGNATURE OF CANDIDATE | SIGNATURE OF INVIGILATOR | | | | | | | | | | | | | | | | | | | | | | |

- | | | | |
|--|---|---|--|
| 1. () () () () 2. () () () () 3. () () () () 4. () () () () 5. () () () () 6. () () () () 7. () () () () 8. () () () () 9. () () () () 10. () () () () 11. () () () () 12. () () () () 13. () () () () 14. () () () () 15. () () () () 16. () () () () 17. () () () () 18. () () () () 19. () () () () 20. () () () () 21. () () () () 22. () () () () 23. () () () () 24. () () () () 25. () () () () | 26. () () () () 27. () () () () 28. () () () () 29. () () () () 30. () () () () 31. () () () () 32. () () () () 33. () () () () 34. () () () () 35. () () () () 36. () () () () 37. () () () () 38. () () () () 39. () () () () 40. () () () () 41. () () () () 42. () () () () 43. () () () () 44. () () () () 45. () () () () 46. () () () () 47. () () () () 48. () () () () 49. () () () () 50. () () () () | 51. () () () () 52. () () () () 53. () () () () 54. () () () () 55. () () () () 56. () () () () 57. () () () () 58. () () () () 59. () () () () 60. () () () () 61. () () () () 62. () () () () 63. () () () () 64. () () () () 65. () () () () 66. () () () () 67. () () () () 68. () () () () 69. () () () () 70. () () () () 71. () () () () 72. () () () () 73. () () () () 74. () () () () 75. () () () () | 76. () () () () 77. () () () () 78. () () () () 79. () () () () 80. () () () () 81. () () () () 82. () () () () 83. () () () () 84. () () () () 85. () () () () 86. () () () () 87. () () () () 88. () () () () 89. () () () () 90. () () () () 91. () () () () 92. () () () () 93. () () () () 94. () () () () 95. () () () () 96. () () () () 97. () () () () 98. () () () () 99. () () () () 100. () () () () |
|--|---|---|--|

Mark of the seal should not overlap the Answer/Circle

EXAM CENTRE SEAL

IMPORTANT DATES AT A GLANCE

| S. No. | Activities | Proposed Date & Day | |
|--------------------------------|---|--------------------------|---------------|
| 1. | Issuing Notification | 20.02.2019 | Wednesday |
| 2. | Opening filling of Online Application Form | 20.02.2019 | Wednesday |
| 3. | Last Date for filling & online depositing the Application Forms Fee | 02.04.2019 | Tuesday |
| 4. | Last date for editing Applications Forms | 04.04.2019 | Thursday |
| 5. | Online Admit cards available | 07.05.2019 | Tuesday |
| 6. | Date of entrance examination | 12.05.2019 | Sunday |
| 7. | Display of OMR sheets, answer key by | 17.05.2019 | Friday |
| 8. | Last date for objections if any | 19.05.2019 | Sunday |
| 9. | Declaration of result & opening of online option form | 28.05.2019 | Tuesday |
| 10. | Last date for depositing the online option form fee | 13.06.2019 | Thursday |
| 11. | Last date for editing the online option form | 14.06.2019 | Friday |
| 12. | Display of 1 st provisional admission list | 17.06.2019 | Monday |
| 13. | Last date for accepting allotment and depositing the fee or submitting request for upward assessment (online) | 19.06.2019 | Wednesday |
| 14. | Display of 2 nd provisional admission list | 23.06.2019 | Sunday |
| 15. | Last date for accepting allotment and depositing the fee or submitting request for 2 nd upward assessment (online) | 26.06.2019 | Wednesday |
| 16. | Display 3 rd provisional admission list | 29.06.2019 | Saturday |
| 17. | Last date for accepting allotment and depositing fee (online) | 01.07.2019 | Monday |
| 18. | Reporting with original documents in respective college up to 5:00PM | 03.07.2019 | Wednesday |
| If seats remains vacant | | | |
| 19. | Opening of option form for online spot counselling | 04.07.2019 | Thursday |
| 20. | Last date for online option form | 06.07.2019 | Saturday |
| 21. | Display of provisional list | 09.07.2019 | Tuesday |
| 22. | Last date for depositing the online fees | 11.07.2019 | Thursday |
| 23. | Reporting in the college | 15.07.2019 | Monday |
| If seats remains vacant | | | |
| 24. | On the spot counselling | 20.07.2019 | Saturday |
| 25. | Reporting in the college | 20.07.2019 | Saturday |
| 26. | Commencement of classes | As per Academic calendar | |

Admission process for 2019-20 will be over by 20th July 2019. Coordinator reserves the right to change the dates.

Coordinator
JET/Pre-PG 2019